ATCO NEWSLETTER

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ATCO SPOTLIGHT TOPIC

Thanks to Beasley, K6BJH (SK) and ATVQ Magazine for allowing us to share his cartoons. For the complete book on "The Best of Beasley" go to the ATVQ Magazine web site (http://atvquarterly.com/) available for purchase.

OL' ED, ON THE OTHER END, AND I WERE PLAYING "QUICK DRAW," AND I THINK I LOST

ACTIVITIES ... from my Workbench

Boy, I hate talking about the weather………well, not really! Everybody does it. I guess it's natural to talk about the things we **don't** like as opposed to the things we **do** like! It's cold outside and I need to shovel the snow off the walk (don't like) but I'm going to break stride a little and discuss ATV things a little (do like) so here goes…

First, repeater news. Well, not much going on there. Everything seems to be working so far. Dale reports that we need to add audio to the DVB-S receiver so he can touch tone some of the options there. He needs access to that because the SOT personnel shut down AC power each Monday morning for a half hour to test the backup generator and that resets our repeater controller. If he could send the needed codes automatically by his computer during bulletin board time via the DVB-S input, then he wouldn't need to do it manually with his 2M transmitter.

The slot antennas at SOT are in pretty bad shape. They need to be replaced. However, it got cold late last Fall so it'll have to wait. Additionally, it's a two-man job. I won't go there alone for this task so I need to find an able volunteer. I'll be looking for help in the Spring when the weather warms up. We won't be bothered by the nesting Falcons this year as they moved the nesting box to another building during some major construction on the building. (Our $2 million tax dollars at work). They hope the Falcons find and use it in its new place rather than trying to build a new nest at the existing SOT location just below our antennas!

In the meantime, I'm hard at work creating a new DVB-S/S2 DATV receiver/ signal analyzer. It's finished now and waiting till we get a manual so we can market them. I plan to sell it for $75 tested in a small enclosure about the size of a cigarette pack. Then I'd like to install an experimental DVB-S transmitter at the SOT on the 709cm band to test signal reception. It is my belief that DVB-S is just as good or better than DVB-T all factors considered. Yes, I know DVB-T is supposed to be better than DVB-S due to multicarrier characteristics for multipath cancellation but the DVB-S transmitter can output 3 to 4dB more power and multipath is not much of a factor on flat terrain like ours. Most DVB-S/DVB-T comparisons have been done in mountainous areas. We'll see but I'm looking forward to the results good or bad!
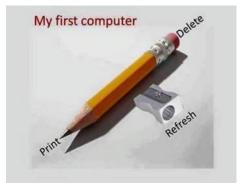
The "Dayton" Hamvention is around the corner and I'm starting to prepare for that. I will need some people to give an ATV related presentation on Saturday at the ATV Forum so if you know anyone willing, please let me know. I know Dave AH2AR is looking into installing a tower there to interface with the Dayton ATV repeater so that could be interesting. If he can, maybe we can re-activate our ATV repeater link on Jones Road in South Vienna to connect with them. The equipment is still there.

Last note: Thank you for all of the membership renewals and donations. That will help fund more activities and have pizza parties. Our treasury is getting to be in better shape now.

That's all for now. Have a safe winter and start thinking about those antenna projects.
…WA8RMC

PS: Since I've had computer issues lately, I'm reminded of how simple it all was just a few short years ago. It's too complicated now!

DAYTON AMATEUR RADIO ATV A5 & D2 REPEATER SYSTEM

By Dave Pelaez AH2AR
The following article was originally in ATVQ Magazine. Reprinted here by permission from AH2AR and ATVQ.

Background

The legacy ATV A5 W8BI Repeater has been running since the mid 80's, and quite a number of regional hams have supported this project. Primary "architects" of the analog AM 70cm and 23cm FM system have included WA8RMC, W8RVH, W8GUC, and with other club members such as KB8OFF, W4HTB, N8ZM, N8ASB and W6CDR, have had technical support roles in various aspects of the analog ATV repeater project. Admittedly, I may have inadvertently left out some hams here, since my direct involvement with the ATV repeater has only been in the last four years.

The focus of this article mainly addresses how the DVB-T transmit/receive equipment has been recently interfaced with the existing 70cm analog AM ATV system. The article also provides some simple solutions or alternative approaches to a few potentially common problems when setting up or running an analog/digital ATV repeater. The ATV repeater also has 23cm FM ATV capabilities, that will not be further addressed in this article.

The analog ATV repeater had been operating continuously, with several site location changes. Its current location is at the Bellefontaine Rd (Huber Heights) Dayton Amateur Radio Club building location. Jessie Nicely, KB8OFF fabricated the Alford Slot antenna that is still in operation. Most recently, we experienced a failure of the ATVR-4 A5 receiver and W8GUC successfully repaired the receiver with a swap-out of the receiver module and replacement of the GaAsFET mixer on the downconverter. With all things considered, and with tens of thousands of hours on the equipment, the analog ATV system has been proven to be extremely reliable. The ATV repeater has mainly been used for the purpose as a "DX Window" during morning ATV DX nets for the Ohio-Indiana-Kentucky regional ATV group*.
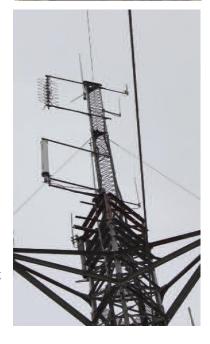
HV110 Installation

In June 2014, I volunteered to configure a DVB-T receive, and later, transmit capability into the legacy system. I added the DVB-T receive function to the legacy repeater by adding a preamplifier and basic splitter
to feed the incoming signals to each receiver. I added a HiDes HV-110 modified with a relay interfaced to the green valid signal LED. The analog
video output of the HV110 passes through the relay when the green LED is operating. The video output from the relay is fed into the Intuitive Circuits ATV controller.

My eventual goal was to keep the legacy A5 portion of the W8BI ATV repeater in place and simply add a complete DVB-T repeater capability so we would not leave a small number of hams that haven't tried the digital ATV mode in the lurch. My preference was also to use the existing legacy 70 cm horizontally polarized transmit and receive antennas on the tower without having to remove the A5 portion of the repeater from service or add any more antennas. The receiver installation was a success as the HV110 DVB-T receiver has been running continuously at the site

since June 2014 without any issues and has only required an occasional remote-recycle of its power supply.

Digital and Analog ATV Transmit Signals sharing the Same Transmit Antenna: A Solution
In December 2016, I proceeded to add an HV310 DVB-T transmit function at the repeater. There appeared to be scant information on the feasibility of combining simultaneous digital and analog ATV transmissions using the same transmit antenna in an effective manner, so I queried ATV gurus WA8RMC and WA6SVT. They provided ideas for my needed starting points regarding hardware and frequency separation suggestions, to fulfill my goal to employ a single transmitter antenna for simultaneous transmission of ATV 70cm transmitters at the site.

With Art and Mike's encouragement regarding the feasibility of simultaneous transmission of the analog and digital ATV signals over a single transmit antenna, I explored several options with off-the-shelf combiner approaches. I settled for use of ferrite Isolator - filter transmitter combiners. An EMR Corporation white paper that discusses ferrite isolator - filter transmitter combiners state the following: "The use of cavity resonators to tie two or more transmitters to a common antenna is more than 35 years old. Where two transmitters were spaced from each other by several MHz, it was possible to place one or more band pass cavities between each transmitter with a "tee" connector connected to the common antenna. Previously, hybrid couplers had been used to combine pairs of transmitters to a common output. When high quality, low loss R. F. isolators became available the idea of using cavities and isolators together to combine multiple transmitters evolved. Since the hybrid coupler has more than 3 dB of loss in each branch, combining four, six or eight transmitters results in losses up to 10 dB in practice. By comparison, the filter ferrite type has much lower losses, leading to it being called "low loss" type by land mobile engineers and technicians."

Further research indicated that ferrite isolator transmitter combiners using a dual junction tunable isolators and bandpass filters appeared to be the best way to go other than to use lossy hybrid couplers. Consequently, I found that the isolators were available on e-bay (model # DB4631-2B, 406 to 450 MHz). Cost of the two combiners was relatively inexpensive ($400 total). The alignment procedure and installation was straightforward, one isolator on each transmitter output. The analog leg already had a TX-RX interdigital filter in place.

I temporarily installed a cavity on the DVB-T leg of the dual transmit system, but performance was marginally adequate until I could obtain an interdigital filter from DCI Company in

Photo 1: Isolator & Filter for Digital TX

Canada. Once the DCI interdigital filter was installed, its performance had significantly improved ATV transmitter- to-transmitter isolation to eliminate the intermodulation that was affecting incoming weak A5 ATV

signals. I opted to keep the A5 transmitter at 421.250 MHz, and set the DVB-T transmitter at 428 MHz. Once installed, the HV310 DVB-T transmitter has been operating continuously (24-7) at the W8BI site.

transmitter side of the combiner configuration. At the far left is the DCI Interdigital filter. Hidden below the fan/heat sink is a Darko 70 cm amplifier module and to the immediate left of the fan/heat sink is one of the dual junction tunable isolators. This open configuration is temporary as we await the acquisition of a cabinet for the digital equipment. It works perfectly this way, problems will likely develop once it is neatly configured in a cabinet!

Photo 2: DB Products Dual Isolator

Above is a dual stage tunable isolator. Note that as of May 2017, these isolators are available through e-bay.

In commercial and government communications, combining new digital services with existing analog voice services often required sharing the same antenna. This is common with the continued changeout/retirement of analog systems. A paper written by William F. Lieske, Sr. Founder, EMR Corporation titled "The Care and Feeding of the R.F. Isolator" described some of the potential issues that may arise when combining analog and digital signals on the same transmit antenna and/or at the same site. He states:

"Currently, many FM (analog) systems are being changed out to digital systems, more or less on a channel by channel basis. This has resulted in a mix of both kinds of systems on most sites and in some cases, has resulted in new problems. Digital bits can heterodyne with analog carriers to produce what can be called "digital I.M." The effect of this on a digital receiver is that erratic reception can occur, causing abrupt loss of reception. In trunked or other controlled access, digital systems various "retry" and "hold open" timing sequences are used to try to overcome this problem. "Digital I.M." simply sounds like noise when present in the pass band of an FM receiver. The net effect is mostly to degrade analog system ranges due to the effective high site noise level that will occur, effectively reducing receiver sensitivity." As Mr. Lieske describes, "Isolators are one of the key components used to help control this form of interference".
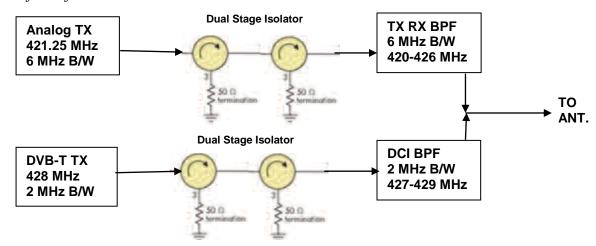

Figure 1. DVB-T & Analog TX Combiner

HV310's Tendency to Glitch when Weak Analog Signals are retransmitted: A Solution

An issue had occurred after I initially installed the HV-310 transmitter. The HV-310 was experiencing transmit encoding lockup and this condition would cause the HV310 to glitch into what appeared to be an uncommon "power-on standby" condition. The glitching required a power recycle to clear the encoder lock. I discovered that the cause of this issue was due to weak genlock and weak horizontal sync pulses whenever we experienced not-so-perfect analog receive video being fed into the input of the DVB-T HV- 310 transmitter for re-transmission. After looking for potential solutions, I completely resolved this glitch issue by installing a video surveillance DVR (with its hard drive removed) that effectively added gen-lock and horizontal sync to all incoming analog video being fed into the HV310 transmitter (*same fix can be done with a time base corrector, editor*). By simply putting the Intuitive Circuit's repeater controller's video output into "channel one" of the DVR's inputs, and then setting the DVR to "single screen mode" for "channel one", the resultant video output provides a rock-stable, gen-locked video source for the analog video input line of the HV310. This works so well that there now is no need to ever recycle the HV310's power supply to clear any glitch. Note that the surveillance DVR that I installed is a DVR model that does not have "blue screen" during the absence of a video signal. Additionally, the repeater has a DTMF remote control link via 2 meters that also allows anyone to go "single

Photo 3: Surveillance DVR

screen" or to the "four-screen" mode on the DVR for the purpose of remote diagnostics. The additional three screens can be used for inputting various video inputs such as receivers and cameras at the site. The DVR as configured could be further used for other functions. However, the DVR's primary function is a viable solution for video the glitch problem. This solution has been so reliable that there has not been a single time where the HV310 transmitter's power has needed to be recycled in the last six months. Photo 3 is a surveillance DVR that can be used to "condition" the video entering the composite video analog input of the HV310. The DVR is a Q-SEE model number QC-444 four channel DVR (look for a DVR without a "blue screen" feature). Most four year or older DVRs don't run with bluescreen. The internal HDD is not needed and can be removed. Once the HDD is removed, there is a lot of room in the case for use with house DTMF controllers or other circuits.

PHOTO 4: Rear Panel of the DVR

The transmit antenna is an Alford Slot. The receive antenna is a Lindsay Array, they are at the top of the 150-ft. tower at the DARA Huber Heights, Ohio clubhouse site.

Recently, we assisted three A5-only hams to get their DVB-T HV-110 receivers up-and-running at their shacks, and this has been the perfect way to help bridge the gap between the analog and digital worlds. Having both DVB-T and analog configuration at our ATV repeater allows for easier transition for hams unfamiliar to D2 by adding an HV110 receiver to

Photo 5: ATV Repeater RX and TX Antennas

directly observe 23cm and 70cm analog video being cross linked through the repeater. But the configuration also allows for the reception of any DVB-T signal activity that may be occurring. The obvious next step is for these hams work on interfacing a digital transmitter to their station.

ATV Repeater ID: Switch from Slides to Full Motion ID Loop
Like a number of Digital ATV repeater operations around the country, the W8BI DVB-T Repeater Video ID is continuously transmitting during the absence of received video throughput. Consequently, the transmitted ID can be used as a beacon by distant ATVers to determine whether band enhancements are occurring. Initially, the W8BI ATV repeater has been running still images that provide ATV repeater information, to include some photos of club members and related ATV activities. Three months ago, I installed a full motion video ID loop that replaced the still video ID slides that we had been using for about 9 years by replacement of the SanDisk jpeg media viewer with a Western Digital WD TV media player (WDBPUF0000NBK).

The media player is able to provide a continuous loop of full-motion video, and this has allowed the ID video to run a recorded pan of the tower and antennas, along with a recorded pan of the repeater equipment with interlaced call letters and repeater information. I like the idea of motion, versus slides, and it may add a better dimension from what one would expect with a standard "slide show" type repeater ID.

In the words of Mike WA6SVT, "This should be a fast scan operation, not slow scan TV!" Since the SanDisk JPEG viewer couldn't run video files, this is the main reason we abandoned it. The WD TV media player "self-starts" in the event of a power bump and is a good addition to the repeater equipment. Note that the WD TV media player is often available on e-bay for $40-$90. It supports very wide number of video CODECs (MPEG-1, MPEG-2 4ASP, AVC, HD/H.264, CV1, WMV9, Xvid. Wrapper formats include AVI, VOB/ISO, ASF/WMV, DVR-MS, MKV, MOV, DAT/VCD/SVCD, TP, TS, M2t, M2ts, OGM. It will also run the following image formats; GIF, BMP, JPEG, TIF/TIFF, PNG. The

media player outputs HDMI at 1080P and it also has a composite video output. A video or image file is simply placed on a thumb drive or external hard drive. There is a media player configuration entry that will allow it to run in a continuous loop, and as mentioned, will start by itself in the event of a power failure when configured to do so, needed features at an unattended repeater site. It has worked flawlessly since install.

Why Settle for Standard Definition DVB-T on the W8BI ATV Repeater when High Definition DVB-T Could be Used?

I am answering this question here to better explain why 2 MHz-wide SD video is being used in the Midwest region. For over 30 years, an informal morning ATV weak signal net has been occurring on 3.930 MHz for Midwest regional hams to coordinate weak signal ATV DX contacts. There is continued

PHOTO 6: WD TV Media Player

frequent success in closing 60-500-mile-long propagation paths between stations using A5, and now D2, when band enhancement conditions permit. Consequently, the W8BI ATV repeater has been one tool that can be used to determine band conditions and serve this function as a "DX window" beacon. To that end, adding DVB-T transmit/receive legs on the ATV repeater continues to support local ATV activity and the regional ATV DX'ers.

Adopting the QPSK constellation parameter at 2 MHz bandwidth for the ATV repeater not only matches the current parameters used by the ATV weak signal group. It also has proven to significantly increase repeater users' link budget performance for at least 50 percent of the current ATVers who would have marginal (P-2 to P-3) A5 repeater coverage. During marginal signal contacts not requiring propagation enhancements, the other DVB-T parameters have been found to be an additional limiter in realized gain. There is still nothing prohibiting ATVers to try point-to-point transmission at the wider bandwidth/ different constellations, in spite of the performance gain differences between the different parameters.

Future Additions: The Arrival of MESH

Since I had some hands-on DVB-T experience to take on the DVB-T integration and virtually no experience with MESH, W8GUC will be using his MESH expertise for the ATV repeater/MESH integration. MESH opens up many new possibilities such as providing a method for linking weekly National ATV nets, allowance for better remote-control functionality, and the provision of making available other video input sources. These three possibilities only scratch the surface of what can be accomplished with a MESH link. Other ATV repeater systems around the country are starting to incorporate MESH, and its integration into ATV will assuredly get a number of "MESH Active" hams interested in ATV.

One Last Item of Note

For additional controller functions at the ATV Repeater site (maybe I should have waited for MESH control!) I noticed a fully assembled DTMF decoder circuit being sold by multiple vendors that was definitely worth looking into. Average delivered price for the DTMF decoder ranges from $12 to $20. The four-channel decoder uses an MT8870 and has four on-board 10 amp relays. I installed it in the DVR for switched video screen functionality and I was surprised how nicely it works. I thought it was a good idea to mention about the availability of the decoder in this article as ATVers could use this circuit at repeater sites and for DTMF control for in-shack projects. The documentation was somewhat hard to find on the Internet but other than that, the DTMF decoder works great!

Photo 7: DTMF Decoder CHEAP CHEAP CHEAP!

The Midwest 70cm ATV DX Net meets daily at approximately 0730 AM Eastern Standard Time on 3.930 MHz LSB for coordination. The regional net includes hams from Ohio, Indiana and Kentucky and occasionally Illinois and Michigan. ATV signal activity during the net uses horizontal polarization for A5 @ 439.250 MHz and D2 (DVB-T) using 2 MHz bandwidth QPSK on 439 MHz.

…73, Dave Palaez AH2AR

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CUBESAT SATELITE LAUNCH

ARLS015 RadFxSat (Fox-1B) Launched Successfully, Designated AO-91. The latest CubeSat in the Fox series - RadFxSat (Fox-1B) – launched November 18 from Vandenberg Air Force Base in California. The Delta II vehicle lifted off at 0948 UTC.

"Following a picture-perfect launch, RadFxSat was deployed at 1109 UTC," AMSAT reported. "Then the wait began. At 1212 UTC, the AMSAT Engineering team, watching ZR6AIC's WebSDR waterfall, saw the characteristic 'Fox Tail' of the Fox-1 series FM transmitter, confirming that the satellite was alive and transmitting over South Africa. Shortly after 1234 UTC, the first telemetry was received and uploaded to AMSAT servers by Maurizio Balducci, IV3RYQ, in Italy. Initial telemetry confirmed that the satellite was healthy."

In the wake of the successful launch, deployment, and reception, OSCAR Number Administrator Bill Tynan, W3XO, designated the new satellite as AMSAT-OSCAR 91 (AO-91). AMSAT Engineering reminds stations that the satellite will not be available for general use until the on-orbit checkouts are complete. AMSAT asks listeners to submit telemetry from RadFxSat (Fox-1B) to assist the Engineering team in completing the commissioning process. Experiment telemetry is downlinked via the DUV sub-audible telemetry stream, which can be decoded using FoxTelem software, available online at, https://www.amsat.org/foxtelem-software-for-windows-mac-linux/ .
... ARRL Headquarters Newington, CT November 20, 2017

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FCC PENALIZES MARKETER OF HAM-BAND DRONE TRANSMITTERS

From the ARRL Letter December 21, 2017.
The FCC has imposed a $180,000 civil penalty on a Sarasota, Florida, company that had been marketing noncompliant audio-visual transmitters intended for use on drones in violation of the Commission's Amateur Service and marketing rules. In an *Order* released on December 19, the FCC explained that Lumenier Holdco LLC (formerly known as FPV Manuals LLC) was advertising and marketing uncertified AV transmitters capable of operating on both amateur and non-amateur frequencies, including bands reserved for federal government use. Some transmitters exceeded the 1 W power limit for Amateur Radio transmitters on model craft, the FCC said.

"Moreover, entities that rely on amateur frequencies in operating compliant AV transmitters must have an amateur license and otherwise comply with all applicable laws for such operation," the FCC said in the *Order*. The FCC said that while it generally has not required amateur equipment to be certified if it operates solely on Amateur Radio frequencies, certification is required if a device can operate outside of the ham bands.

Last January, in what it called an "extremely urgent complaint" to the FCC, ARRL targeted the interference potential of a series of audio/video transmitters used on unmanned aircraft and marketed as Amateur Radio equipment. ARRL General Counsel Chris Imlay, W3KD, said those transmitters used frequencies intended for navigational aids, air traffic control radar, air route surveillance radars, and global positioning systems.

In addition to paying civil penalty, Lumenier has admitted to marketing the noncompliant AV transmitters, will enter into a *Consent Decree* with the FCC to settle the enforcement proceeding and terminate the investigation. The case stemmed from complaints received by the Enforcement Bureau's Spectrum Enforcement Division. "The investigation revealed that some of the AV transmitters marketed by Lumenier were capable of being operated outside of the authorized Amateur Radio Service bands, including on frequencies reserved in whole or in part for federal agencies, but were not certified or otherwise compliant with the rules," the FCC said in its *Order*. "These AV transmitters are considered intentional radiators and must comply with the Commission's Equipment Authorization and Marketing rules."

The FCC said that Lumenier ceased marketing the noncompliant transmitters after receiving a *Letter of Inquiry* from the FCC last April.

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A NEW DVB-S/S2 DATV RECEIVER

I have been working on a new DATV DVB-S/S2 receiver design the last 6 months or so and is now finished. It is contained in a small enclosure about the size of a cigarette package that is completely assembled and tested. The DATV-Express group is responsible for the design, construction and sale of this item named "Minitiouner-Express" previously designed by Jean Pierre Courjaud F6DZP.

We will sell it at our DATV-Express.com web site through PayPal for $75 plus shipping, ($7 USA and $33 to all other countries). We have tentatively terminated the sale of the DATV-Express transmitter board which was a very successful product with over 250 sold worldwide but now it's time to move on. The "MiniTiouner-Express" DVB-S/S2 tuner/receiver/analyzer on the right is the result.

This unit connects between an antenna(s) and a PC computer USB2 port using a Windows 7, 8 or 10 operating system. It will receive DVB-S/S2 144MHz to 2420MHz digital television signals with symbol rates between 100K symbols/sec and 10M symbols/sec when used with the included MiniTioune software. In operation, the computer monitor will display the received video and graphic quadrature constellation of the landing dots, show graphically the level and quality of the incoming signal and display the FEC data with setup parameters.

It has two "F" female RF inputs to receive up to two simultaneous independent signals viewed one at a time with A or B soft keys in the MiniTioune software downloaded at: http://www.vivadatv.org/viewtopic.php?f=60&t=416. The resultant video and diagnostics are then shown on the computer monitor display. There are provisions to source a DC voltage on either or both RF connectors to power a preamplifier at the antenna. Since the MiniTiouner-Express itself will operate from a +8 to +24VDC source, the preamp voltage requirements dictate the MiniTiouner-Express supply voltage.

The user must provide both the correct USB cable and a DC power source. The DC requirements are 12VDC @ ~300Ma without DC preamplifier power. The enclosure's aluminum cover protects the internals from damage but is not rated for outdoor use. Because of the USB limitation, it must be operated close to the computer. The RF input sensitivity is about -95dBm at FEC=7/8 or -100 dBm at FEC=1/2 which is better than the best set top box I've tested. MiniTiouner-Express has an internal preamplifier but because of its wide bandwidth, it has a rather poor noise figure. Therefore, a bandpass filter and preamp at the antenna is recommended. If a Down East Microwave preamplifier is used, the 1288MHz threshold signal level will go down to about -105dBm at FEC=1/2.

The Tutioune software was created by Jean Pierre Courjaud, F6DZP in France. (The name Tutioune" comes from the French word roughly meaning "to tune"). It is primarily used to receive the HamVideo DATV in the International Space Station but is also widely utilized by Hams all over the world as an excellent DVB-S and DVB-S2 diagnostic utility so digital ATV signals can be measured precisely. We congratulate Jean Pierre for his excellent software contribution to the advancement of DATV DVB-S/S2 pioneering. He has worked hard in recent years to create the Minitiouner and Minitiouner Pro circuit boards for which this design is based. Without his work, it would have been very difficult to achieve.

…WA8RMC

FCC APPROVES NEXT-GEN TV FOR OTA BROADCASTING

From TV Technology magazine December 2017. For complete article see
http://www.tvtechnology.com/atsc3/0031/fcc-approves-nextgen-tv-for-ota-broadcasting/282290

Television broadcasters can begin to offer Over-the Air ATSC 3.0 service while maintaining legacy DTV transmission November 16, 2017

WASHINGTON—The FCC today by a 3-2 vote along party lines authorized broadcasters to begin on a voluntary basis over-the-air transmission of next-generation television based on the ATSC 3.0 standard.

The action is widely seen as a critical milestone in the years-long effort to introduce a new over-the-air television standard that is more efficient and better positions TV broadcasters to compete in today's digital media environment.

"Today is a promising day for consumers, an exciting day for technological innovation and a historic day for the broadcast business," said FCC Chairman Ajit Pai in a statement before the commission vote to authorize ATSC 3.0.

Authorization "open[s] the door to substantially improved, free over-the-air broadcast television service and fiercer competition in the video marketplace," he said.

The vote requires broadcasters choosing to begin voluntary ATSC 3.0 transmission to partner with another broadcaster to simulcast ATSC 1.0 service to ensure OTA viewers of legacy DTV maintain their service.

In authorizing next-gen TV, the agency is requiring 1.0 simulcasts to deliver "substantially similar" programming as the 3.0 channel for five years. However, the vote provides for certain exceptions, such as ads, promos for upcoming programs and programming features that takes advantage of new 3.0 capabilities.

The FCC vote maintains mandatory carriage rights of the legacy DTV simulcast on cable and satellite TV systems, but does not require it for broadcasters' next-generation TV service.

The vote adds ATSC /321:2016 system discovery and signaling (bootstrap) and A/322:2017 physical layer protocol standards to the FCC rules for the purpose of interference calculation. The new rules require broadcasters use A/322 only for their primary streams and opens the possibility of sun-setting the requirement after five years.

The vote imposes the same public interest obligations required of existing TV broadcasts on next-generation TV service. It also requires broadcasters to provide on-air notifications to educate viewers about next-gen TV deployment and simulcasting.

LPTV and translator stations will be allowed on a case-by-case basis to seek waivers to the simulcast requirement if no viable simulcast partner is available.

In opposing authorization, FCC Commissioner Mignon Clyburn took issue with the lack of backwards compatibility of the next-gen TV standard with ATSC 1.0. Consumers' existing TVs and cable equipment "will not be able to receive a next-gen signal."

"If you are an over-the-air viewer, you will either need to purchase a new television set or some sort of converter, and if you are a pay TV viewer you would need to purchase a new set-top box," she said.

While acknowledging "there is a lot to be excited about" when it comes to next-gen TV, such as UHD pictures, immersive audio, advanced emergency alerts and innovative interactivity, Commissioner Jessica Rosenworcel echoed Clyburn's concern about the lack of backwards compatibility with ATSC 1.0 and the cost to consumers.

"I think the way the FCC plans to proceed is no great boon for consumers: it's a tax on every household with a television," she said, calling upon the agency to go back to the drawing board and find "a less disruptive way to facilitate broadcast innovation."

However, FCC Commissioner Michael O'Reilly took issue with viewing ATSC 3.0 as a tax on consumers. "I believe this item [the ATSC 3.0 authorization rulemaking] has taken great care to ensure that is not the case," he said. "Indeed, if this is a consumer tax, so is every new tablet or smartphone a consumer decides to purchase."

The "parade of horribles and hypotheticals" some have offered up over the past few weeks that will stem from next-gen TV authorization are "divorced from reality because broadcasters have every incentive in the world to make sure their viewers do not lose signal during and after any transition to 3.0," said O'Reilly.

In his comments before the vote, Commissioner Brendan Carr pointed out the FCC has been "moving steadily away from dictating" use of specific technologies in the standards setting process. He pointed to the wireless sector as an example where the agency has adopted flexible-use licenses and other market driven advancements that steer clear of using specific devices.

"Today, we move slowly in that direction by allowing broadcasters to use a new standard for next-generation TV known as ATSC 3.0. By granting their request, we give broadcasters the freedom to innovate," he said.

KEN'S KORNER

On the following pages are a number of articles from Ken, W8RUT dedicated to MESH activity. Ken has worked diligently and with much effort to bring us to the forefront of this exciting twist of Ham Radio. "What is all of this hype?" you might ask. We are in a new era of Amateur Radio where many potential entries into this field simply don't want to spend the time needed to enjoy a hobby that requires a lot of technical skill. They are busy multiplexing interests among many areas so if it can't be purchased as a "plug and play" item, they don't have the desire to pursue it farther. In addition, most of their entertainment can be satisfied with their cell phone or I-pad.

It's not really the case here as you can see by reading the following pages. MESH CAN be that "Plug-and Play" item many desire but it has more. It combines the plug-and-play aspect along with new ways to communicate and technical skill opportunities. Check out Ken's articles carefully. I'm sure you will agree it could have interest for you. You can simply purchase node equipment for as little as $200 and sit back and enjoy participating with the activity, or perhaps you're interested in emergency communications. Here too MESH shines. Want to get involved with the technical aspects of site planning, equipment and antenna design? Here's an area available for innovation. Many possibilities exist so read on to see for yourself!

The first 2 articles are most important to those not yet involved with MESH. The last 3 deals mainly with applications for MESH once you know the basics. Read on……….
…WA8RMC

HAM INTERNET (MESH): IT'S NOT FOR EVERYONE…

Let's face it. Not all hams love all of the technical challenges of our hobby. Even those hams who build their own antennas or enjoy soldering components to PC boards shy away from new technologies and not be early adopters, but some Hams do. This diversity of interest is one of the greatest strengths of the hobby! Like the Ham who focuses on supporting public service events and preparing for future emergencies, or the contester that's really into radio sport, or the CW operator who love his/her nets, we all are drawn to different fascists of the hobby. Many hams enjoy more than one fascist of the hobby.

Then who is interested in Mesh and why?

Ham Mesh, or Ham Internet, (there are now 31 Ham Mesh Nodes active in Central Ohio) is one of those fascists in its current state of maturity, that draws mainly two interest groups: EMCOM (ARES) and technical people who enjoy the challenge of integrating low power microwave communication, and computer networking. After all, most anyone's Smart Phone has far more capability than Ham Mesh at present! We also enjoy a powerful internet, **until we don't have either!** Natural disasters often play havoc with both phone and internet services! During a disaster, only the central phone or internet provider needs to be taken off line to make the service unavailable to thousands of people.

When disaster strikes, this is when Ham Mesh can really shine. The basic architecture of Ham Mesh is a peer to peer system. Every node on the network become a "repeater' of sorts that can self-configure when nodes join or leave the network. This capability is very powerful. This means any node can connect to any other node, even if it's not within range via other nodes on the network. When multiple paths are possible, Mesh will automatically choose the best path to connect to distant nodes.

How does it work?
Referring to figure 1, Node "I" has three "current neighbors" to directly connect. Since the current neighbors can connect to other nodes, Node "I" can also connect to the "Remote Nodes" automatically. Any application, Voice, Data or video can connect.

Figure 1

Referring to figure 2, one can connect to both sides of the Mesh Status list just by clicking on the node you want to connect. "Current Neighbor" (right column) or "Remote Node" (Left column) is the same procedure- Just click on the node! Node "I" wants to see what node "A"

Figure 2

camera is seeing, Node I just clicks on Node A's camera. If Node "I" wants to see 4 different cameras, located at 4 different nodes, Node "I" can use "AnyCam" software to display all 4 cameras/videos at the same time. Figure 3 Same is true for any other "Services" available on the Mesh Network, including IP Phones, Data Base Servers, web sites, Text Messaging- "Mesh Chat", etc.

So, what are the Challenges of Ham Mesh?

Figure 3

First: **Establishing a Node: This is Microwave Technology**
The technical challenges of Ham Mesh include establishing the network of Nodes, both home and Nodes located on tall towers and buildings (no mountains in Ohio!). More nodes create the opportunity for more paths to remote nodes.   Cost to establish nodes in high places is also a factor. The cost for a home Ham Mesh Node is approximately $100 if you already have a laptop. For home stations, the big challenge is getting your Mesh Node above the trees or wait until the leaves fall! QRM is also a factor in Mesh. 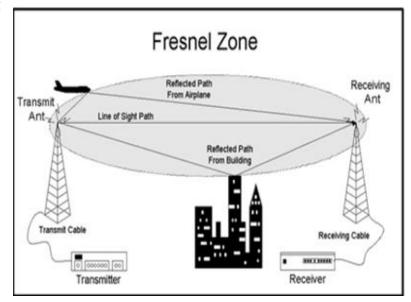Strong nearby 2 GHz transmitters will have an impact on the noise floor. Multi-pathing can cause lost packets and keep the link quality less than perfect to poor. The FRESNEL Zone which is the area around your main signal can cause problems if a tree or building extends into it.

This is Microwave protocol! These and other issues sometimes need to be dealt with in establishing a Mesh station. Portable and mobile operation takes even more skill to be successful.

Second: **Software and Networking Challenges**
Understanding how the AREDN network works is another challenge. This is a different networking environment than the internet networking you may be familiar. Lots of opportunity to learn about it from the AREDN.org web site, U tube and "Help" in the AREDN software. There is also an ARRL book on the subject that is very good. The Maxtown Mesh Breakfast each month is also a good learning place. Understanding the application software associated with 'Mesh Services" is also a challenge. Camera software, using active X or AnyCam is a good example. IP phones on Mesh also have a few tricks to use them easily. Our "Mesh Store", a BIG 4 Terabyte server on our Mesh network is more like using a big drive on your laptop, once you have connected it.

Ham Mesh is not for everyone. Ham Mesh is about as mature, from an application point of view, as the internet in the mid 1990's. But like the internet, Ham Mesh is growing and maturing fast! There is lots of learning and investigating to do before you can declare success. This takes time and more than a few gray cells. If, however, you are into public service, Ham Mesh is becoming an excellent ARES tool to use to provide, voice, data and video to served agencies like the Red Cross. If you are looking for a challenge that integrates Microwave radios, software, networking, network applications, and deploying the technology in fixed, portable and mobile applications, Mesh may be for you.
…Ken-W8RUT

HAM MESH STATUS IN CENTRAL OHIO

Over the last 3 years, Ham Mesh has grown in number of stations, activity and applications in the US as well as Central Ohio. This exciting mode of operating is another form of the Digital evolution all around Amateur Radio. Packet, PSK 31, DATV, DMR, System Fusion, D-Star, JT 65/9 and LT 8 digital modes are all good examples. The great enabler for these new modes is computing power in PC or embedded in the radio (like DMR, System Fusion). Amateur Radio is better as a result.

A little history

Before 2010, a Texas group formed Broadband-Hamnet™ (BBHN) to focus on writing software to run on the ever-popular Linksys WRT-54G Routers. This effort was quite successful and many Hams got started on Mesh using the Linksys routers and the BBHN software. Many of the early technical standards and terminology created by BBHN are still in use today. An Amateur Radio Group called Amateur Radio Emergency Data Networks (AREDN.org), with many of the same BBHN developers was formed to focus on Ham EMCOM. AREDN began using a sub-set of a new hardware/software platform from Ubiquity Networks (www.UBNT.com) in 2015. AREDN Software takes advantage of a number of these outdoor rated, High Power devices (aka Nodes) which can be used on part 97 Ham Frequencies to avoid the part 15 interference of normal routers.
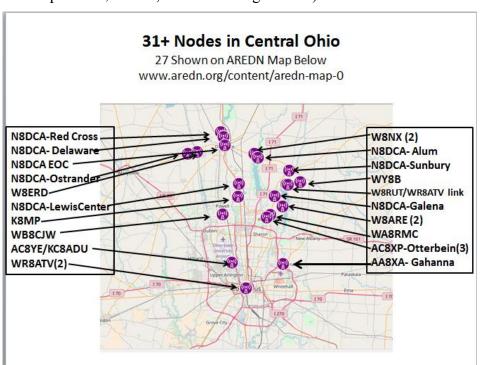
Enter ATCO in Mesh

In the Spring of 2014 at one of our Saturday Breakfast discussions, the topic came up on how ATCO could attract new (read young!) members to our club. We had already accomplished being the first North America Digital ATV repeater. Since the majority of the Breakfast participants were "Techie" by nature, we chose this path instead of the "Social" path to gain new members (ATCO still has this problem today!). During our brainstorming, MESH was suggested as technologies that may help ATCO grow in future years. The first problem was very little was known in our group about MESH! As Techies, we could learn!

Present Day Mesh in Central Ohio

Figure 1 is a snapshot of many of the full time Nodes that have registered with AREDN and displayed on their website. Nodes used mobile (AA8XA & W8RUT have full time mobile Nodes), portable (mostly used during ARES events) and experimental (Like the Solar powered, e-Bike, "Node in a bag" Nodes) are not shown.

Figure 1

Also, not shown is K8OC-Portable (Otterbein College club call) operated by AC8XP from various locations around campus. We hope to interest some of the students at Otterbein.

31+ Nodes in Central Ohio
27 Shown on AREDN Map Below
www.aredn.org/content/aredn-map-0

N8DCA-Red Cross
N8DCA- Delaware
N8DCA EOC
N8DCA-Ostrander
W8ERD
N8DCA-LewisCenter
K8MP
WB8CJW
AC8YE/KC8ADU
WR8ATV(2)

W8NX (2)
N8DCA- Alum
N8DCA-Sunbury
WY8B
W8RUT/WR8ATV link
N8DCA-Galena
W8ARE (2)
WA8RMC
AC8XP-Otterbein(3)
AA8XA- Gahanna

The Nodes with call signs N8DCA (Delaware County ARES), AA8XP Gahanna, WR8ATV are on towers 120 feet to 180 feet tall with WR8ATV (co-located with the ATV Repeater) at 650 feet above street level. More high place nodes are needed, with Nodes in Westerville and Upper Arlington in the planning/approval stage. We do need more tall sites in the other (mostly south of I-70) suburbs so if you know of any, please let me know.

Figure 2

What Applications are on the Central Ohio Mesh today?

There are a growing number of applications on our Central Ohio Mesh network. Figure 2 shows a typical Mesh screen showing "Advertised Services" from various nodes. Cameras and IP phones are most popular. There are also a number of Text Messaging servers known as Mesh Chat that works like a Blog with "channels".

Figure 3
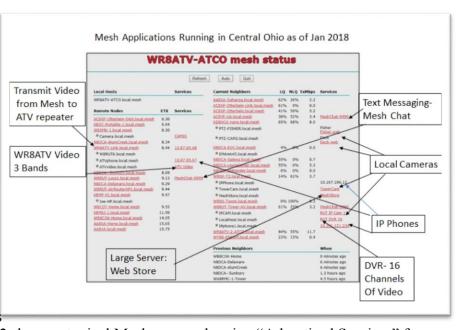
WR8ATV-Link

The WR8ATV-Link node can show three of the WR8ATV repeater output videos (70, 23, 10 GHz) plus a Bulletin Board (Figure 3) and it can transmit video of your choosing back to the repeater input. There is a "How To" article available for this application.

Figure 4
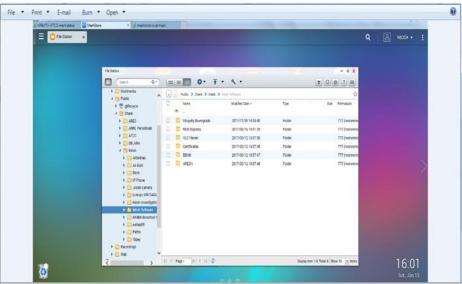
Large Storage Server- WebStore

Another useful capability on our Mesh Network is a large NAS Server QNAP (see figure 4). It has two Tera Bytes (expandable) of RAID storage available. "The WebStore" currently has loaded on it a great number of Mesh related articles/info, Mesh Software, ARRL QSTs (2000-2014), ATCO info, Maxtown Mesh Society Breakfast Info and other useful information. You can add this file server to your PC just by defining it as a drive on your PC, Like Z: and have direct access to the drive the same way you talk to your other drives on your PC. WebStore is hosted by

Mesh Store- 2 Tera_bytes of Storage
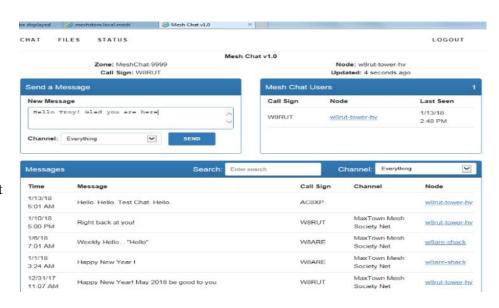
John, W8NX Mesh site.

Figure 5

Mesh Chat a Mesh "Blog"

An easy application is Mesh-Chat (see Figure 5). It is a simple application that is hosted in the Node in which it is configured, but is available to anyone on the network. Several Mesh Servers are already configured on our network thereby avoiding a single point of failure.

Other applications on the Central Ohio Mesh Network

Some other application currently on our mesh network includes;
1. Mobile Nodes (AA8AX, W8RUT, W8ARE, others)
2. Solar Powered Nodes
3. Node on an electric Bike (see article)
4. Many Portable Nodes to support ARES activities (W8ERD)
5. 'Node in a Bag"- W8RUT - (See Article)
6. ?

Some future applications in the works;
1. Full email system WIN-Link
2. Remote control of an HF Transceiver (IC 7300 -75-6 meters)
3. Real Time Weather Station access
4. Lighting Strike Map
5. Public Service work
6. ??

Central Ohio Mesh is very active and growing! Your PC, $100 in Mesh equipment, get high enough above your trees or be close enough to another node to get through them and you too can join in in this exciting new part of our hobby!

For help to get started, contact W8RUT, W8NX, W8ARE, AC8YE, and W8ERD and others listed on the map. They will point you in the right direction.
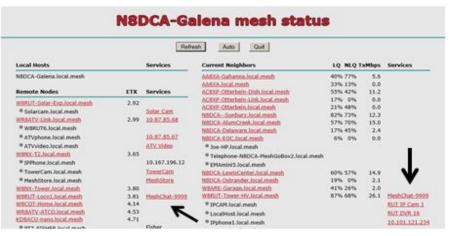
Ken-W8RUT

MESHCHAT- A BLOG WITH CHANNELS
Very Easy to Use…

One of the simple but powerful applications for Ham-Mesh is MeshChat. You don't need to load your node with the software in order to use it. Just click on any of the MeshChat Services (Server) on any node that has it listed.

Once clicked on the MeshChat Service, you will see a screen to enter your call sign. Enter your call.
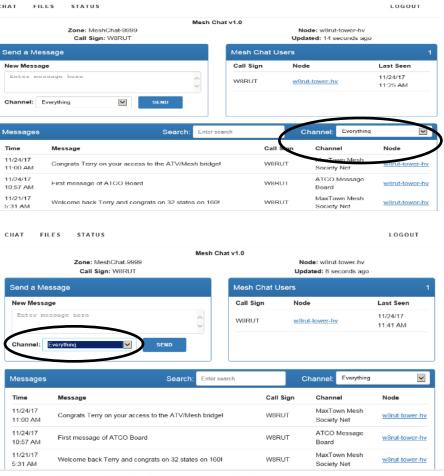
The next screen shows MeshChat Messaging, beginning with all ("Everything") channels. This channel shows all messages for all channels. The dropdown box allows you to select any one of the created channels to view just those messages.
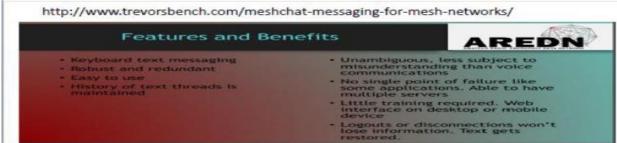
To send a message, select which channel you want via the drop-down box or just leave it "Everything". You can also create your own channel. Type your message in the "Send a Message Box" then "Send".

That's it! Very easy to use and the Mesh App is useful.

If you would like to load MeshChat on your Node, follow the link shown below.

If you have questions or comments, please let me know. Ken-W8RUT

THE "E-BIKE" – ONE STEP AWAY FROM A "CLOWN CAR"!

W8RUT Electric Bike Mobile
- Tri-Band 2/220/440- FM
- Mesh 2.4G –Bullet/Tablet
- IP Cam & GPS /Entertainment
- 9 db Mesh- 6 db w/uhf
- Disk Brabes-F & R
- 36V Motor in Rear Hub
- 18 MPH max speed
- 12 Miles Range
- 15 Deg Incline
- Head/Tail/Brake Lights
- Horn/36 V Batt monitor

OK, I'm lazy. I admit it! I have a 250-foot driveway (500 feet round trip) that I must walk each morning to get the newspaper, then again in the afternoon to get the snail mail. If I had a "FitBit", I could accumulate steps credit each day towards my health goal. This notion sounded good, but not much fun because the number of steps each day will not win any bragging rights! I will have to work on that….later.

While search for a wearable technology monitoring system (I have to have the latest techno, don't I?) I ran across an ad for the Electric Bike below:

Up-to 18 MPH, Range 12 miles, Inclines to 15 degrees, Weights up to 280 Lbs, Front & Rear Disk-Brakes, Headlight/Taillight/Brakelight, Battery Monitor/ 36 Volt system, Electric Motor in wheel hub

Wow, this looked like much more fun than a FitBit! I purchased it. Damn those "One Click" buttons anyway! Oh, but it gets worse… The "Might-as-wells" started to kick in…

On my maiden trips to the mail box, it occurred to me it would be nice to listen to our 2 meter hangout which also had a 440 output. I happen to have a Chinese Tri-band rig (2/222/440) that was very small that would fit easily on the handle bars of the bike. Wonderful. Now the next the problem: Power Supply and antenna for the rig! Not so easy. I need to add more mounting space to the bike. Once I found a luggage rack that would mount to the seat post and hang over the rear wheel, it was really down hill from there!

I converted the luggage rack to hold a 7.5 Amp/hr SLA and a place to mount a triband 2/220/440 antenna. Well, it worked great. I was able to get into the UHF side of the ATV FM at WR8ATV Repeater from my front yard using the 25 watt rig some 20 miles away. I share this activity with the e-Bike at one of our Maxtown Mesh Breakfast meetings, then it happened: someone jokingly asked, "Where is the Mesh Node?". After a bit of chuckles from the group, I decided to take it on as a challenge!

Under the newly added rack, was a good place to mount a UBNT Bullet with a elbow N adapter to screw on a 2.4 GHz antenna. Since the Node will run on 12v, a PoE was added and supplied with 12v. Next was a way to monitor the Node which a Tablet computer with a USB to Ethernet adapter fit the bill. Naturally, the Mobile Mesh station had to do something usefull, so an IP Camera was added just under the handle bars to transmit video (a multi port PoE was also added). A battery monitoring LCD meter was added to check of battery life and performance (see photo). The last thing that was added was a GPS Navagation (normally mounted in a car). Why? Because I had one on hand and there was a space for it between the Tri-band radio and the Tablet!

Before Camera and GPS were mounted

Battery and antenna(s) mounting.

Video from the Bike mounted Camera

Battery Power Monitor

What could such a contraption be used for? Maybe during ARES covered parades, or other events where a highly mobile unit that does not make much noise could be used.

It snows in Ohio. I wonder if I could add some out-rigger ski to ride it on the snow…
I wonder if I should have gone for the FitBit instead? Although this project was a lot more fun to put it all together than any FitBit!

Ken,
Get real!! what good is a vehicle like that without GPS? You could get lost going to the mailbox! Ed.

Ken-W8RUT

HANDY NODE…OR "NODE-IN-A-BAG"

Recently, I had the opportunity to experiment with 7-inch tablet computers with both the "e-Bike" and as my SUV Mobile Node, instead of a PC. The little tablet does not have an Ethernet port, but it does have a USB port that you can use with a USB to Ethernet adapter. After having success using a tablet computer with both the e- Bike and Mobile, I started thinking about a small portable station. About that same time, AREDN began supporting the indoor only rated Ubiquiti AirRouters. The AirRouter comes in two flavors, low power (about 28 mW) and a high-power version (about 600 mW). The cost is reasonable at $35 for low power and $50 for the High-Power version.

This seemed to be a good opportunity to combine the 7-inch tablet with an AirRouter to form the basis of a small portable Node Station. I chose the low power version for this project. The low power version runs on +5v, so I needed a 5V power supply, but I don't need a PoE to power the Node. The AirRouter also has a 4 port Ethernet switch built in, eliminating the need for an external switch. I wanted to keep the whole package independent of external power. I chose a Solar Charger Antun Battery Pack 22400mAh High Capacity Power Bank Solar Power Bank. It can power both the AirRouter and the Tablet.

Fig 1: AirRouter (back showing Ports)
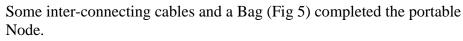
Fig 2: 5v Battery Pack with Solar Panel

Fig 3: USB/Ethernet Adapter

Fig 4: 7 Inch Tablet running Windows 8

Some inter-connecting cables and a Bag (Fig 5) completed the portable Node.
The Node in a bag can connect to the Mesh network as seen in figure 6 at right.

This is a short-range Node, meaning you need a nearby node to be able to connect to the entire 30+ Node network in Central Ohio.

Adding Useful Applications. The Handy-Node as it stands can do anything any Node can do on the Mesh network, including Video access, MeshChat and our 'WebStore' Data Server. Since the AirRouter has 4 usable Ethernet ports built in, it is now easy to add additional applications. Figure 7 shows two additional Mesh Applications added: 1.a PTZ IP Camera and, 2. A Cordless IP Phone. Adding a power supply (12v) to power the Camera and phones was accomplished using TalentCell 12V DC Output Lithium Ion Battery Pack. The PTZ Camera, Cordless IP Phone, Battery Pack and inter-connecting cables all fit nicely in the yellow and Black bag shown.

Although by Mesh standards, the Node-in-a-bag demonstrates how small, portable with good range of applications a Mesh station can be. If, on the other hand, I compare this station with a "Smart Phone", it's still big and bulky!

Maybe someday we will have a 'Smart Mesh Node' the size of today's Smart Phone! These bags do remind me of my first portable/car phone, which did come in a bag!

…Ken-W8RUT

Fig 7: PTZ Camera, Cordless IP Phone, Battery Pack and Bag.

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NEW MEMBER(S)

Let's welcome the new members to our group! If any of you know anyone who might be interested, let one of us know so we can flood them with information. New members are our group's lifeblood so it's important we aggressively recruit new faces.
No new members at this time.

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LOCAL HAMFEST SCHEDULE

This section is reserved for upcoming Hamfests. They are limited to Ohio and vicinity easily accessible in one day. Anyone aware of an event incorrectly or not listed here; notify me so it can be corrected. This list will be amended, as further information becomes available. To see additional details for each Hamfest, Control Click on the blue title and the magic of the Internet will give you the details complete with a map! To search the ARRL Hamfest database for more details, CTL click ARRLWeb: Hamfest and Convention Calendar …WA8RMC.

01/28/2018 | Tusco ARC Hamfest, Electronics
Location: Strasburg, OH
Type: ARRL Hamfest
Sponsor: Tusco Amateur Radio Club
Website: http://tuscoarc.org

02/18/2018 Mansfield Hamfest
Location: Mansfield, Ohio
Type: ARRL Hamfest
Sponsor: Mansfiels Amateur Radio Club
Website: www.arrl.org/hamfests/mansfield-mid-winter-hamfest-4

03/04/2018 | Winter Ham Fest
Location: Elyria, OH
Type: ARRL Hamfest
Sponsor: Northern Ohio Amateur Radio Society
Website: http://noars.net

03/17/2018 | Mid-Ohio Valley ARC Hamfest
Location: Gallipolis, OH
Type: ARRL Hamfest
Sponsor: Mid-Ohio Valley Amateur Radio Club
Website: https://sites.google.com/site/midohiovalleyarc/home/movarc-hamfest

03/18/2018 | Toledo Mobile Radio Association Hamfest
Location: Perrysburg, OH
Type: ARRL Hamfest
Sponsor: Toledo Mobile Radio Association
Website: http://www.tmrahamradio.org

04/14/2018 | Cuyahoga Falls ARC's 64th Annual Hamfest
Location: **Cuyahoga Falls, OH**
Type: **ARRL Hamfest**
Sponsor: **Cuyahoga Falls Amateur Radio Club**
Website: **http://www.cfarc.org/hamfest.php?festnow=2018**

04/21/2018 | Portsmouth Radio Club Hamfest
Location: Portsmouth, OH
Type: ARRL Hamfest
Sponsor: Portsmouth Radio Club
Website:
http://www.facebook.com/groups/portsmouthradioclub/

04/29/2018 | Athens Hamfest
Location: Athens, OH
Type: ARRL Hamfest
Sponsor: Athens County Amateur Radio Association
Website: http://www.ac-ara.org/

06/02/2018 | FCARC Summer Fest
Location: Wauseon, OH
Type: ARRL Hamfest
Sponsor: Fulton County Amateur Radio Club
Website: http://k8bxq.org/hamfest

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TUESDAY NITE NET ON 147.48 MHz SIMPLEX

Every Tuesday night @ 9:00PM WA8RMC hosts a net for the purpose of ATV topic discussion. There is no need to belong to the club to participate, only a genuine interest in ATV. All are invited. For those who check in, the general rules are as follows: Out-of-town and video check-ins have priority. A list of available check-ins is taken first then a roundtable discussion is hosted by WA8RMC. After all participants have been heard, WA8RMC will give status and news if any followed by late check-in requests or comments. We usually chat for about ½ hour so please join us locally or via internet at www.BATC.tv then ATV repeaters thenWR8ATV.

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ATCO TREASURER'S REPORT - de N8NT

OPENING BALANCE (10/15/17) ....…...…………………......…$ 1443.70
RECEIPTS(dues)…...……………………….......…$ 210.00
Donations……..…………………………...……………………..……$ 210.00
Fall Event food……………………………………………………………………………………….....…$ (239.62)
PayPal fee………………………………………………………………………………………………….$ (6.49)
CLOSING BALANCE (01/16/18) …………………………………………………………………….…....…$ 1617.59

ATCO REPEATER TECHNICAL DATA SUMMARY

Location: Downtown Columbus, Ohio
Coordinates: 82 degrees 59 minutes 53 seconds (longitude)   39 degrees 57 minutes 45 seconds (latitude)
Elevation: 630 feet above the average street level (1460 feet above sea level)

TV Transmitters:
- 423.00 MHz DVB-T, 10 W cont, FEC=7/8, Guard=1/32, Const=QPSK, FFT=2K, BW=2MHz, PMT=4095, PCR=256, Video=256, audio=257
- 427.25 MHz Analog VSB AM, 50 watts average 100 watts sync tip (cable channel 58)
- 1258 MHz 40 watts FM analog
- 1268 MHz DVB-S QPSK 20W continuous. SR=3.125MS, FEC=3/4, PMT=32,Video=162,Teletext=304,PCR=133,Audio=88,Service =5004)
- 2397 MHz Mesh Net transceiver 600mw output (channel 1 -2). ID is WR8ATV-2
- 10.350 GHz: 1 watt continuous analog FM

Link transmitter: 446.350 MHz: 5 watts NBFM 5 kHz audio. This input is used for control signals.

Identification:
- 423, 427, 1258, 1268 MHz, 10.350 GHz transmitters video ID every 10 min. with active video and information bulletin board every 30 minutes.
- 423 MHz digital, 1268 MHz digital & 10.350 GHz analog - Continuous transmission of ATCO & WR8ATV with no input signal present.

Transmit antennas:
- 423.00 MHz – 8 element Lindsay horizontally polarized 6dBd gain "omni"
- 427.25 MHz - Dual slot horizontally polarized 7 dBd gain "omni" major lobe east/west, 5dBd gain north/south
- 1258 MHz   - Diamond vertically polarized 12 dBd gain omni
- 1268 MHz   - Diamond vertically polarized 12 dBd gain omni
- 2397 MHz   - Ubiquiti dual polarity omni 13dBi gain slot for channel 1 -2 MESH Rx/Tx operation
- 2397 MHz   - Comet Model GP24 vertically polarized 12 dBd gain omni (Used for experimental Mesh operation)
- 10.350 GHz - Commercial 40 slot waveguide slot horizontally polarized 16 dBd gain omni

Receivers:
- 147.480 MHz - F1 audio input with touch tone control. (Input here = output on 446.350)
- 438.000 MHz - DVB-T QPSK, 2K BW. Receiver will auto configure for FEC's and PID's. (Input here = output on all TV transmitters)
- 439.250 MHz - A5 NTSC video with FM subcarrier audio, **lower sideband**. (Input here = output on all TV transmitters)
- 449.975 MHz - F1 audio input aux touch tone control. 131.8 Hz PL tone. (Input here = output on 446.350).
- 1288.00 MHz - F5 video analog NTSC. (Input here = output on all TV transmitters)
- 1288.00 MHz - DVB-S QPSK digital SR=4.167Msps, FEC=7/8. PIDs: PMT=133, PCR=33, Video=33, Audio=49 (Input here feeds all TV transmitters and also goes directly to 1268 MHz DVB-S digital output channel 2.)
- 2398.00 MHz - F5 video analog NTSC. (Input here = output on all TV transmitters) (inactive at this time because of MESH on 2397)
- 10.450 GHz - F5 video analog NTSC. (Input here = output on all TV transmitters)

Receive antennas:
- 147.480 MHz - Vert. polar. Diamond 6dBd dual band (Shared with 446.350 MHz link output transmitter)
- 438.00/439.250 MHz - Horizontally polarized dual slot 7 dBd gain major lobe west (Shared with 438 & 439 receivers)
- 1288.00 MHz - Diamond vertically polarized 12 dBd gain omni (shared with analog and DVB-S receivers)
- 2398.00 MHz - Comet Model GP24 vertically polarized 12 dBd gain omni (inactive at this time because of MESH on 2397)
- 10.450 GHz - Commercial 40 slot waveguide horizontally polarized 16 dBd gain omni

Auto mode Input control:	Touch Tone	Result (if third digit is * function turns ON, if it is # function turns OFF)
	00*	turn transmitters **on** (enter manual mode-keeps transmitters on till 00# sequence is pressed)
	00#	turn transmitters **off** (exit manual mode and return to auto scan mode)
	264	Select Channel 4 Doppler radar. (Stays on for 5 minutes) Select # to shut down before timeout.
	004	Select 10.450 GHz receiver. (**Always exit by selecting 001**)
	003	Select room camera (**Always exit by selecting 001**)
	002	Select roof camera. Select room cam first then 002 for roof cam. (**Always exit by selecting 001**)
	001	Select 2398 MHz receiver then 00# for auto scan to continue

Manual mode Functions:	Touch Tone	Result
	00* then 1 for Ch. 1	Select 439.25 analog /438 digital receiver (if video present on digital, it is selected. Otherwise analog)
	00* then 2 for Ch. 2	Select 1280 digital receiver
	00* then 3 for Ch. 3	Select 1280 analog receiver
	00* then 4 for Ch. 4	Select 2398 receiver
	00* then 5 for Ch. 5	Select video ID (17 identification screens)
	01* or 01#	Channel 1 439.25 MHz scan enable (hit 01* to scan this channel & 01# to disable it)
	02* or 02#	Channel 2 1288 MHz digital receiver scan enable
	03* or 03#	Channel 3 1288 MHz analog receiver scan enable
	04* or 04#	Channel 4 2398 MHz scan enable
	A1* or A1#	Manual mode select for 439.25 receiver audio
	A2* or A2#	Manual mode select for 1288 digital receiver audio
	A3* or A3#	Manual mode select for 1288 analog receiver audio
	A4* or A4#	Manual mode select for 2398 receiver audio
	C0* or C0#	Beacon mode – transmit ID for twenty seconds every ten minutes
	C1* or C1#	C1* to turn off 438 MHz DVB-T Tx, C1# to enable it (Must be in manual mode to enable this function).
	C2* or C2#	C2* to turn off 423 MHz DVB-T Rx, C2# to enable it (Must be in manual mode to enable this function).

Note: The DVB-T Tx and Rx units can lock up when they lose video or see bad video. When this happens, power must be cycled. To do this select C1 or C2* to turn off power. A few seconds later select C1# or C2# whichever appropriate to restore power to selected unit. Wait about 15 to 30 seconds to see restored operation. (Example: To reset the DVB-T receiver enter C2*, wait a few seconds then C2#)*

ATCO MEMBERS as of January 2018

Call	Name	Address	City	St	Zip	Phone
KC3AM	Dave Stepnowski	735 W Birchtree Ln	Claymont	DE	19703	
AH2AR	Dave Pelaez	1348 Leaf Tree Lane	Vandalia	OH	45377	937-264-9812
W8ARE	Terry Meredith III	6070 Langton Circle	Westerville	OH	43082-8964	
VK3BFG	Peter Cossins					
NN8B	Don Kemp	6384 Camp Blvd.	Hanoverton	OH	44423	
N9BNN	Michael Glass	6836 N. Caldwell Rd	Lebanon	IN	46052	
WB8CJW	Dale Elshoff	8904 Winoak Pl	Powell	OH	43065	614-210-0551
N8COO	C Mark Cring	2844 Sussex Place Dr.	Grove City	OH	43123	614-836-2521
N8CXI	Garry Cotter	2367 Northglen Drive	Columbus	OH	43224	
N3DC	William Thompson	6327 Kilmer St	Cheverly	MD	20785	301-772-7382
K8DMR	Ron Fredricks	8900 Stonepoint Ct	Jennison	MI	49428-8641	
W8DMR	Bill Parker	2738 Florbunda Dr	Columbus	OH	43209	
WA8DNI	John Busic	2700 Bixby Road	Groveport	OH	43125	614-491-8198
N8DUK	Ron Reynolds	2173 Noe Bixby Rd	Columbus	OH	43232-4131	
K8DW	Dave Wagner	2045 Maginnis Rd	Oregon	OH	42616	419-691-1625
WB8DZW	Roger McEldowney	5420 Madison St	Hilliard	OH	43026	614-405-1710
KB8EMD	Larry Baker	4330 Chippewa Trail	Jamestown	OH	45335-1210	
N8FRT	Tom Flanagan	6156 Jolliff St.	Galloway	OH	43119	
W8FZ	Fred Stutske	8737 Ashford Lane	Pickerington	OH	43147	
WA8HFK,KC8HIP	Frank & Pat Amore	P.O. Box 2252	Helendale	CA	92342	614-777-4621
WA8HNS	Mike Gray	5029 St Rt 41 NW	Wash. Ct House	OH	43160-8740	740-335-5133
K8KDR,KC8NKB	Matt & Nancy Gilbert	5167 Drumcliff Ct.	Columbus	OH	43221-5207	614-771-7259
W8KHP	Allen Vinegar	2043 Treetop Lane	Hebron	KY	41048	
WA8KKN	Chuck Wood	5322 Spruce Lane	Westerville	OH	43082-9005	614-523-3494
WA8KQQ	Dale Waymire	225 Riffle Ave	Greenville	OH	45331	937-548-2492
WB8LGA	Charles Beener	2540 State Route 61	Marengo	OH	43334	
N8LRG	Phillip Humphries	30856 Coshocton Road	Walhonding	OH	43843	614-3543744
W8MA	Phil Morrison	154 Llewellyn Ave	Westerville	OH	43081	
KA8MFD	Ross McCoy	227 S Boundary St PO Box 9	Edison	OH	43320	
KA8MID	Bill Dean	2630 Green Ridge Rd	Peebles	OH	45660	
N8NT	Bob Tournoux	3569 Oarlock Ct	Hilliard	OH	43026	614-876-2127
W8NX, KA8LTG	John & Linda Beal	5001 State Rt. 37 East	Delaware	OH	43015	740-369-5856
WU8O	Tom Walter	15704 St Rt 161 West	Plain City	OH	43064	614-733-0722
N0OBG	Jim Conley	33 Meadowbrook C C Est	Ballwin	MO	63011	
W6ORG,WB6YSS	Tom, Maryann O'Hara	2522 Paxson Lane	Arcadia	CA	91007-8537	626-447-4565
N8OCQ	Bob Hodge Sr.	3750 Dort Place	Columbus	OH	43227-2022	
AE6QU	Ron Phillips	2227Via Puerta unit N	Laguna Woods	CA	92637	
WA8RMC	Art Towslee	438 Maplebrooke Dr W	Westerville	OH	43082	614-891-9273
W8RUT,N8KCB	Ken & Chris Morris	2895 Sunbury Rd	Galina	OH	43021	
KB8RVI	David Jenkins	1941 Red Forest Lane	Galloway	OH	43119	614-853-0679
W8RWR	Bob Rector	135 S. Algonquin Ave	Columbus	OH	43204-1904	614-276-1689
W8RXX, KA8IWB	John & Laura Perone	3477 Africa Road	Galena	OH	43021	614-579-0522
WA6RZW	Ed Mersich	34401 Columbine Trl West	Elizabeth	CO	80107	
WA6SVT	Mike Collis	PO Box 1594	Crestline	CA	92325	
KD8TIZ	Bob Holden	5161 Goose Lane Rd	Alexandria	OH	43001-9730	614-562-8441
W8TIP	Gene Hawkins	1720 Liberty Street	Toledo	OH	43605	
K8TPY, K8FRB	Jeff & Dianna Patton	3886 Agler Road	Columbus	OH	43219	
NR8TV	Dave Kibler	243 Dwyer Rd	Greenfield	OH	45123	937-981-1392
KB8UWI	Milton McFarland	115 N. Walnut St.	New Castle	PA	16101	
WA8UZP	James Reed	818 Northwest Blvd	Columbus	OH	43212	614-297-1328
KB9VGD	Gary Oaks	472 Storle Ave	Burlington	WI	53105-1028	
KC8WRI	Tom Bloomer	PO Box 595	Grove City	OH	43123	
AA8XA	Stan Diggs	2825 Southridge Dr	Columbus	OH	43224-3011	
AC8XP,KE8GTT,KE8HPA	Troy,Seamus Bonte	5210 Smothers Road	Westerville	OH	43081	
AC8YE	Larry Howell	1163 Cloverknoll Ct	Columbus	OH	43235-4008	
KB8YMQ	Jay Caldwell	4740 Timmons Dr	Plain City	OH	43064	
KC8YPD	Joe Ebright	3497 Ontario St	Columbus	OH	43224	
KD8YYP	Anna Reed	818 Northwest Blvd	Columbus	OH	43212	
WB8YTZ	Joe Coffman	233 S. Hamilton Rd	Gahanna	OH	43230-3347	
N8YZ	DaveTkach	2063 Torchwood Loop S	Columbus	OH	43229	614-882-0771
KA8ZNY,N8OOY	Tom & Cheryl Taft	386 Cherry Street	Groveport	OH	43125	614-202-9042
W8ZCF	Farrell Winder	6686 Hitching Post Ln.	Cincinnati	OH	45230	513-218-3876
N8ZM	Tom Holmes	1055 Wilderness Bluff	Tipp City	OH	45371	

ATCO MEMBERSHIP INFORMATION

Membership in ATCO (Amateur Television in Central Ohio) is open to any licensed radio amateur who has an interest in amateur television. The annual dues are $10 per person. Additional members within an immediate family and at the same address are included at no extra cost.

ATCO publishes this Newsletter quarterly in January, April, July, and October. It is sent to each member without additional cost. All Newsletters are sent via Email unless the member does not have an internet connection. Dues payments are as the date paid and will expire on the same month/year on the due date year.

Your support of ATCO is welcomed and encouraged.

Membership expiration notices will be sent out via Email starting 30 days prior to expiration date.
NOTE: Dues records on your individual portion of the ATCO website are listed as the date money is received and shows due one year from that date.

ATCO MEMBERSHIP APPLICATION

RENEWAL   ○   NEW MEMBER   ○   DATE _____

CALL _____

OK TO PUBLISH PHONE # IN NEWSLETTER YES ○   NO ○

HOME PHONE _____

NAME_____

INTERNET Email ADDRESS_____

ADDRESS _____

CITY _____ STATE _____ ZIP _____-_____

FCC LICENSED OPERATORS IN THE IMMEDIATE FAMILY

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COMMENTS_____

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ANNUAL DUES PAYMENT OF $10.00 ENCLOSED   CHECK ○   MONEY ORDER ○

Make check payable to ATCO or Bob Tournoux & mail to: Bob Tournoux N8NT 3569 Oarlock CT Hilliard, Ohio 43026. Or, if you prefer, pay dues via the Internet with your credit card. Go to www.atco.tv and fill out the "pay ATCO dues" section. Alternately, you can use the ATCO web site www.atco.tv/PayDues.aspx directly. Credit card payment is made through "PayPal" but you DO NOT need to join PayPal to send your dues. Simply DO NOT fill out the password details and there will be no "PayPal" involvement.

ATCO CLUB OFFICERS

ATCO Newsletter
c/o Art Towslee -WA8RMC
438 Maplebrooke Dr. West
Westerville, Ohio 43082

FIRST CLASS MAIL

REMEMBER...CLUB DUES ARE NEEDED.
CHECK THE
MEMBERS PAGE OF ATCO WEBSITE FOR THE EXPIRATION DATE.
SEND N8NT A CHECK OR USE PAYPAL IF MEMBERSHIP IS EXPIRED.